Abstract

Surface science is a fascinating scientific subject that defines the issue of amphiphiles and more specifically micellar and thermodynamic characteristics of surface active substances called surfactants. The surfactants have wide spread applications in the field of drug delivery, detergency, pharmaceutical formulations and solubilization of drugs. The applications in the field of drugs are of paramount importance in the present scenario of struggle for existence of human beings. Surface active drugs because of their surfactant like nature assemble to form small organized aggregates such as micelles, micro-emulsions, vesicles, used as models to stimulate life system at a concentration known as critical micelle concentration (CMC). Micelles provide important functional properties to drugs which in turn change in the presence of additives (electrolytes and non-electrolytes). Consequently, in the present study we proposed to investigate the effects of different electrolytes viz. sodium chloride (NaCl), potassium chloride (KCl), rubidium chloride (RbCl), magnesium chloride ($MgCl_2$), calcium chloride ($CaCl_2$) and strontium chloride ($SrCl_2$) on micellar behaviour of some surface active drugs namely, streptomycin sulphate and diphenhydramine hydrochloride in terms of electrostatic and hydrophobic interactions through conductivity, density and speed of sound, viscosity and surface tension measurements. The critical micelle concentration (CMC) values and different thermodynamic parameters of micellization like enthalpy of micellization (ΔH_m^o), entropy of micellization (ΔS_m^o), free energy of micellization (ΔG_m^o), apparent molar volume (ϕ_v), isentropic compressibility (κ_s), apparent molar isentropic compression (ϕ_κ), etc. will be calculted by employing these techniques. UV Visible and Fluorescence spectroscopic techniques will also be used to facilitate the outcomes of above mentioned studies.

Keywords: Conductivity, Critical Micelle Concentration, Electrolyte, Fluorescence, Surface active drug, Surface tension, UV Visible.